

# Rishidev Chaudhuri

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## Positions

**Assistant Professor** 04/2019 – present

University of California, Davis  
Center for Neuroscience  
Department of Neurobiology, Physiology, and Behavior  
Department of Mathematics

**Postdoctoral Fellow** 08/2014 – 01/2018 and 06/2018 – 10/2018  
The University of Texas at Austin, Center for Learning & Memory  
Adviser: Ila Fiete

**Google Research Fellow** 01/2018 – 05/2018  
University of California, Berkeley,  
Simons Institute for the Theory of Computing

**Postdoctoral Associate** 09/2013 – 07/2014  
New York University, Center for Neural Science  
Adviser: Xiao-Jing Wang

## Education

**Ph.D. in Applied Mathematics** 05/2013  
Yale University  
Dissertation title: *Timescales and the large-scale organization of cortical dynamics*  
Adviser: Xiao-Jing Wang

**M.Phil. in Applied Mathematics** 2010  
Yale University

**B. A. in Physics** 2006  
Amherst College  
Magna cum laude

## Awards & Honors

Graduate Program Advising and Mentoring Award, UC, Davis	2023
Distinguished Service Award, Neuroscience Graduate Group, UC Davis	2023
Sloan Research Fellowship	2021
Google Research Fellowship at Simons Institute for the Theory of Computing, Berkeley	2018
Finalist for Burroughs-Wellcome's Career Award at the Scientific Interface	2016, 2017
Best Tutorial Award, Janelia Neurotheory Workshop	2016
Amherst College Fellowship for graduate study	2007, 2008, 2009
Phi Beta Kappa	2005
Amherst College Dean of Faculty Grant for summer research	2005
Howard Hughes Fellowship for summer research	2004
Basset Prize for Physics	2002

## Publications & Preprints

Yoo SJB, El-Srouji L, Datta S, Yu S, Incorvia JA, Salleo A, Sorger V, Hu J, Kimerling LC, Bouchard K, Geng J, Chaudhuri R, Ranganath C, O'Reilly R (2024). Towards Reverse-Engineering the Brain: Brain-Derived Neuromorphic Computing Approach with Photonic, Electronic, and Ionic Dynamicity in 3D integrated circuits. *arXiv:2403.19724*

Chandra S, Sharma S, Chaudhuri R, Fiete I (2023). High-capacity flexible hippocampal associative and episodic memory enabled by prestructured "spatial" representations. *bioRxiv* 2023.11.28.568960; doi: <https://doi.org/10.1101/2023.11.28.568960>

De A & Chaudhuri R (2023). Common population codes produce extremely nonlinear neural manifolds. *Proceedings of the National Academy of Sciences* 120, e2305853120.

McKee K, Crandell I, Chaudhuri R & O'Reilly R (2022). Adaptive synaptic failure enables sampling from posterior predictive distributions in the brain. *arXiv:2210.01691*

Langdon AJ & Chaudhuri R (2021). An evolving perspective on the dynamic brain: notes from the Brain Conference on *Dynamics of the brain: temporal aspects of computation*. *European Journal of Neuroscience* **53**, 3511 doi:10.1111/ejn.14963. (Meeting report)

Moore E & Chaudhuri R (2020). Using noise to probe recurrent neural network structure and prune synapses. *Advances in Neural Information Processing Systems* **33**. (Selected as Spotlight)

Kriener B\*, Chaudhuri R\* & Fiete IR (2020). Robust parallel decision-making in neural circuits with nonlinear inhibition. *Proceedings of the National Academy of Sciences* **117**, 25505 (\* co-first author).

Chaudhuri R & Fiete IR (2019). Bipartite expander Hopfield networks as self-decoding high-capacity error correcting codes. *Advances in Neural Information Processing Systems* **32**.

Chaudhuri R, Gerçek B\*, Pandey B\*, Peyrache A & Fiete IR (2019). The intrinsic attractor manifold and population dynamics of a canonical cognitive circuit across waking and sleep. *Nature Neuroscience* **22**, 1512.

Chaudhuri R, He B & Wang XJ (2018). Random recurrent networks near criticality capture the broadband power distribution of human ECoG dynamics. *Cerebral Cortex* **28**, 3610.

Chaudhuri R & Fiete IR (2016). Computational principles of memory. *Nature Neuroscience* **19**, 394 (Review)

Chaudhuri R, Knoblauch K, Gariel M-A, Kennedy H & Wang XJ (2015). A large-scale circuit mechanism for hierarchical dynamical processing in the primate cortex. *Neuron* **88**, 419.

Chaudhuri R, Bernacchia A & Wang XJ (2014). A diversity of localized timescales in network activity. *Elife* **3**, e01239.

Churchland AK, Kiani R, Chaudhuri R, Wang XJ, Pouget A & Shadlen MN (2011). Variance as a signature of neural computations during decision-making. *Neuron* **69**, 818.